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EXAMINER
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LEE, JINHEE J

ART UNIT	PAPER NUMBER
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2831

DATE MAILED: 03/29/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/725,836

Applicant(s)

SUN ET AL.

Examiner

Jinhee J Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Drawings***

1. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

This figure is described in the back ground art.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description:

Item 10.

A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

Items 14, 80 and 68.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

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4. Applicant is required to submit a proposed drawing correction in reply to this Office action. However, formal correction of the noted defect may be deferred until after the examiner has considered the proposed drawing correction. Failure to timely submit the proposed drawing correction will result in the abandonment of the application.

***Specification***

5. The disclosure is objected to because of the following informalities:

At page 2 line 26, "from on end" is confusing. Examiner suggests, "from one end" instead to clarify.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 2, 4, 5, 6-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the limitation "the out-of-plane device" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

Claim 4 recites the limitation "the out-of-plane device" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claim 5 recites the limitation "the electrical conduction material" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claim 6 recites the limitation "the device layer" in line 2. There is insufficient antecedent basis for this limitation in the claim. This limitation is also stated in claim 6 line 4, claim 11 lines 1-2 and line 3.

Claim 6 recites the limitation "the ribbon structure" in lines 4-5. There is insufficient antecedent basis for this limitation in the claim. This limitation is also stated in claim 6 line 11, claim 12 lines 1-2.

Claim 6 recites the limitation "the out-of-plane device" in line 8. There is insufficient antecedent basis for this limitation in the claim. This limitation is also stated in claim 12 line 4, claim 13 lines 1-2, claim 14 line 4 and lines 4-5, claim 15 line 4.

Claim 8 recites the limitation "the isolation region" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 9 recites the limitation "the electrical conductive material" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim. This limitation is also stated in claim 10 lines 3-4.

Claim 15 recites the limitation "the horizontal plane" in line 5. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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9. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Dhuler et al. (5962949).

Re claim 1, Dhuler et al. discloses a hinge comprising: a silicon-on-insulator wafer including a bottom substrate layer, a middle buried oxide layer and a single crystal silicon device layer (column 10 lines 46-52 according to the numbering in the middle); a ribbon hinge structure (52,54) formed in the device layer of the silicon-on-insulator wafer, wherein the ribbon hinge structure is flexible and capable of movement out of the plane of the device layer; and an electrical conductor (56) carried on at least a portion of a surface of the ribbon hinge (see figures 4 and 5).

Re claim 2, Dhuler et al. discloses a hinge wherein the out-of-plane device (16 figure 1A) is fabricated from a silicon-on-insulator wafer which has an initial uniform device layer thickness (see column 10 lines 46-52).

Re claim 3, Dhuler et al. discloses a hinge wherein the ribbon is configured with a mechanical integrity which permits application of a side-twisting mechanical torque sufficient to twist the ribbon hinge to 90° or more from an initial 0° twisted position (XY and Z directions, see abstract).

Re claim 4, Dhuler et al. discloses a hinge wherein the ribbon structure has at least one of a width or thickness which is less than at least one of a width or thickness of the out-of-plane device (see figure 4).

Re claim 5, Dhuler et al. discloses a hinge wherein the ribbon hinge has at least one of (i) an isolation region formed within the ribbon hinge, and within which is deposited the electrical conduction material, or (ii) an area of insulation material which

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has been deposited and then patterned on the ribbon hinge area, wherein conductors can then be placed on top of the insulator material (see figure 4).

***Allowable Subject Matter***

10. Claim 6 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

11. Claims 7-15, would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter: The primary reason for the indication of the allowability of claims 6-15 is the inclusion therein, in combination as currently claimed, of the limitation of a ribbon hinge formed on the device layer, the ribbon structure having been thinned to a thickness which is less than the thickness of the micro-device; a connection interface providing a connection point between a first end of the out-of-plane device and a first end of the ribbon hinge; and an electrical conductor material extending along the ribbon structure toward the micro-device. This limitation is found in claims 6-15 and is neither disclosed nor taught by the prior art of record, alone or in combination.

***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Dhuler et al.(6275320), Loo et al.(6046659), Loo et al. (6331257), Hichwa et al. Goodwin-Johansson (6236491), Goodwin-Johansson (6229683), Goodwin-Johansson

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(6057520) and Zavracky et al. are cited to show various components of a micro assembly.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jinhee Lee whose telephone number is 703-306-0154. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on 703-308-3682. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3431 for regular communications and 703-305-1341 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

jji  
March 22, 2002

 3/25/02  
DEAN A. REICHARD  
SUPERVISORY PATENT EXAMINER  
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